

COP27 POLICY BRIEF SERIES

Models for energy and transport policymaking in Zambia

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Summary

This brief makes the case for incorporating models into Zambia's policymaking process, particularly for the energy and transport sectors. It does this through looking at the current state of modelling and policymaking in Zambia and by interviewing key Zambian stakeholders. Considering the many challenges in these two sectors, the Government needs to carefully plan and efficiently allocate its resources.

Models, simplified representations of real-world systems, are critical to this process. However, energy and transport models use in supporting policymaking in Zambia is limited. To enhance their use, we recommend approaches for creating high-level awareness of models among policymakers, strengthening capacity and skills, and better institutional arrangements. This will increase responsiveness to policy needs and enhance the sustainability of the models developed.

Key Policy Recommendations

- Energy and transport models have considerable potential to aid policymaking and can also enhance policy implementation in any country.
- The value and opportunities for these models to inform and influence policymaking in Zambia exist, but there remain significant barriers and gaps for this to be realized.
- To address these barriers and gaps, three recommendations are made:
 - create high-level awareness and interest in models among policymakers,
 - strengthen the capacity of modellers and analysts who advise policymakers or feed into the policy process, and
 - improve institutional arrangements to enhance independence and align incentives.

Introduction

This brief makes the case for incorporating models into Zambia's policymaking process, particularly for the energy and transport sectors. It does this through looking at the current state of modelling and policymaking in Zambia and by interviewing key Zambian stakeholders. Government policy, more precisely referred to as public policy, refers to a statement of goals, objectives and courses of action outlined by the

Government to provide guidance for intended actions towards development. The policy provides direction of how policymakers should allocate Government resources in order to achieve the intended development objectives. Thus, public policy is core to attaining sustainable development in any country.

However, the process by which public policy is formulated is influenced by many factors, such as lobbying and political campaign promises. It also involves stakeholders from diverse backgrounds with multiple perspectives and objectives. This complicates the policymaking process and can lead to negative developmental outcomes. In the case of Zambia, these complexities are further exacerbated by the impacts of climate change, such as droughts and floods, and public debt related pressures.

Therefore, to develop better policies that are more strongly evidence based, the Government could use energy and transport models to aid its policymaking process, notably in the formulation and consultation stages (see **Figure 1**). Models are particularly valuable in countries whose development and growth has to be climate resilient. In addition, models can assist countries with limited financial resources to more efficiently allocate their resources to sectors and investments that most enhance development.

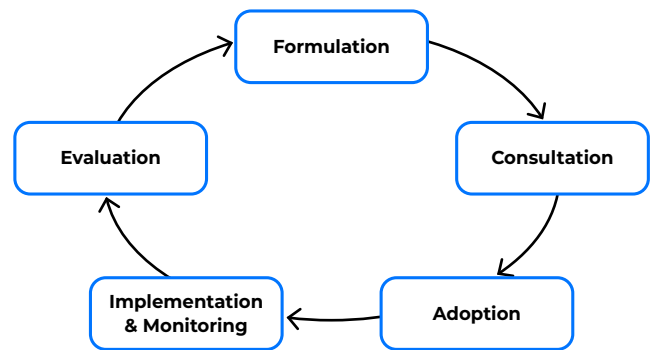


Figure 1: The Public Policymaking Cycle (Authors' own construction)

Models are simplified representations of real-world systems. In the broadest sense, “a model is a purposeful, mathematical simplification of reality – smaller, less detailed, less complex, or all of these together – of some structure or system” [1–2]. Because of their simplicity, models can facilitate the evaluation and assessment of various policy options in a short time and in a relatively risk free and inexpensive environment for a given purpose.

What are the benefits of using models?

Three key benefits of using models to aid policymaking can be identified [3]:

- A. Modelling could serve as a learning process and enhance understanding of the phenomenon being analysed for a potential policy action;
- B. Considering the diverse background of stakeholders, models could be used as a basis for facilitating discussion between stakeholders; and
- C. Through the use of models, alternative policy options can be simulated and the effects studied systematically within a short timeframe without affecting the real system.

These benefits, when considered together or alone, highlight the immense value that models offer as instruments for informing and influencing policy decisions. For example, Susser *et al.* [2] highlight the role that models played in the negotiation space by bringing together diverse views. By using models, decision-makers and policymakers can explore and create a shared understanding of uncertain futures and options of possible actions.

However, when policies and strategies are developed without the use of models, it has been observed that it results in ineffective outcomes, with potentially sizeable negative effects [4]. For instance, the Government of Zambia has initiated (in 2022) the process to revise its Transport Policy, which was approved in 2019, due to the realization that key aspects of climate change were not considered in the development of the Policy.

What are the risks of using models?

Despite the value they bring, applying models to policymaking comes with some risks and challenges. Finding the required data for model implementation can be a challenge. To elaborate, models may require inputs for which there is no reliable data, creating a risk for the credibility of the outputs. Even when all the required information is available, models also carry the risk of being used to support the policies they are meant to objectively influence. Both the inputs into the model and the output can be interpreted to provide credibility to a policy decision that has already been taken, whereas what they should be used for is to inform that decision of whether a policy decision should be taken or how a policy should be implemented [5–6].

“Models can assist countries with limited financial resources to more efficiently allocate their resources to sectors and investments that most enhance development.”



PHOTO: TOM CHIPONGE BAROQUE M. C. / PIXABAY

Because of the complexity of models, there is a risk that such practices might promote ‘policy-based evidence making’ [2]. This risk highlights the strong requirement for modellers’ independence and ethical behaviour as they execute their modelling responsibilities.

Even where the purpose and context of the model are well matched, models often carry the risk of being too complicated, time consuming, and expensive. Such models result in limited adoption to support decision-making, as they are considered to be unable to deliver timely support [2, 5].

In Zambia, the risks and challenges outlined above are observed at different stages of the policymaking process. For example, in some cases the pre-developed models come as a part of the financing from project funders. In such instances, models are often used to validate an already held position (of the project funder). This takes away learning opportunities and

agency (opportunity for meaningful input) from the Government. It further reduces trust in models and their benefits, as they are perceived as not transparent. Added to this, most institutions in Zambia that could potentially support Government with analytic services have limited capacity to evaluate such pre-developed models. This lack of capacity renders the model unusable for policy purposes. This was described by one of the interviewees:

“ Even the models that I was referring to, these models are developed by [foreign] consultants, but then you see that within the [local] team maybe very few people have interest to run that particular model on a continuous basis to be able to inform policy formulation in a particular Ministry ” ECONOMIST

How was the research conducted?

With the focus of identifying opportunities where energy and transport models could best support energy and transport policymaking in Zambia, two key approaches were undertaken. Firstly, a comprehensive review of models and their value in aiding policymaking was done. This was complemented by a detailed review of Zambia’s policymaking process. The focus of the review was to understand how models are currently applied to the policymaking process, and identify the stages of policymaking that

offer the opportunities for model outputs to influence process.

Secondly, semi-structured interviews¹ were undertaken with eight Zambian stakeholders. The interviewed stakeholders were from the government, academia, central bank, and private sector: with backgrounds ranging from statistics, economics, national planning, policy analysis, agricultural sciences, and engineering. These interviews focused on getting the stakeholders’ views on the following topics: their understanding of the policymaking process in Zambia; identifying key entry points for model outputs into policymaking; assessing the modelling skills of Government departments and agencies and the country at large; and proposing how best these potential gaps (financial, institutional, and skills) that might exist in Zambia could be addressed.

What are the key gaps?

While the stakeholders highlighted the value that models add to policymaking process, they also observed that currently models are not well integrated into the process. In addition to the challenges given above, below are some gaps that have been identified:

“ First and foremost, people don't even understand or know that you need them [models]. ... therefore, people believe in a hunch. ” DEVELOPMENT PLANNER

¹ The questions that were asked in these interviews are included in the Working Paper on which this Brief is based. The Paper is currently under review.

- i. **Policymakers struggle to understand models** both in terms of how they are made and their output, and thus they may not be aware of the value they add to the policymaking process.
 - ii. **Some local models do not speak to the policy issues that are of immediate concern to the policymaker.** For models to inform policymaking, they should be correctly specified and fit for that purpose.
 - iii. **There is limited capacity** to develop and implement fit-for-purpose models and analyse model outputs. To be more useful and widely accepted by policymakers, models need to be developed more transparently with respect to the assumptions included, accessibility of software used, and open to scrutiny by other experts.
 - iv. **Inadequate institutional arrangements and relationships** that would ensure that both the modellers and models can have and continue to have a positive impact on the policy process. There is currently no institution (both inside or outside Government) with a focus on producing models to support public policymaking.
1. **Create high-level awareness and interest in models among policymakers.** This could be achieved through information sharing and capacity-building programmes;
 2. **Strengthen the capacity of modellers and analysts** who advise policymakers or feed into the policy process; and
 3. **Improve institutional arrangements,** so that independence is guaranteed and incentives are well aligned.

Conclusions and Policy Recommendations

Models are essential to understanding and solving complex challenges like those in Zambia's energy and transport sectors. In particular, models are key to informing the development of policies and strategies that aim to address these challenges. However, there remain gaps for models to effectively support policymaking processes in Zambia.

To increase model responsiveness to policy needs and enhance sustainability of models developed, we make three recommendations on how to best achieve this and also address the existing gaps:

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ACKNOWLEDGEMENTS:

Dr Stephanie Hirmer (Oxford University) and Prof. Jim Watson (University College London) have led the curation of this policy brief series. The policy briefs underwent an anonymous (double blind) peer-review process. They were edited by Simon Patterson (Loughborough University) and designed by Sarel Greyling (Sarel Greyling Creative).

This material has been produced under the Climate Compatible Growth (CCG) programme, which brings together leading research organizations and is led out of the STEER centre, Loughborough University. CCG is funded by UK aid from the UK government. However, the views expressed herein do not necessarily reflect the UK government's official policies.



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CITATION: Tembo, B., Pye, S., Cronin, J., and Millot, A. (2022). Models for energy and transport policymaking in Zambia. Climate Compatible Growth Programme COP27 Policy Brief Series (Version 1). Available at: <https://doi.org/10.5281/zenodo.7107843>